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Wright

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[54] **BLADE GUIDE**

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[52] **U.S. Cl.** **83/820;** 83/807; 83/808; 83/821

[58] **Field of Search** 83/807, 808, 820, 821

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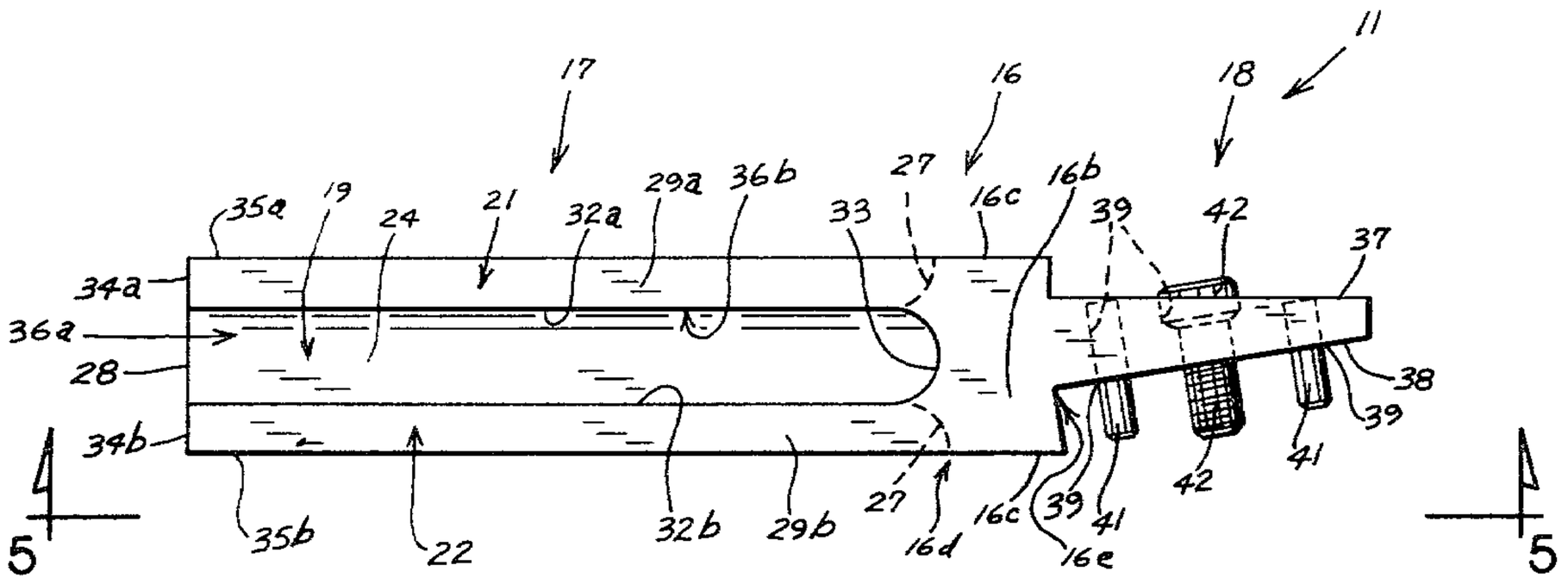
Attorney, Agent, or Firm—Henderson & Sturm

[57] **ABSTRACT**

The blade guide invention relates to devices employed in bread slicing machines to guide band blades. Mounting to increase cutting accuracy and providing for increased life and reduced tendency to seize the band blades is achieved by a blade guide (**11**) with body, guide and attachment portions (**16, 17, 18**) formed in a unitary construction. The guide portion includes spaced apart prongs (**19, 21, 22**) with improved wear surfaces (**24, 31*a*, 31*b***) forming a channel (**36*a***) for the band blade.

8 Claims, 7 Drawing Figures



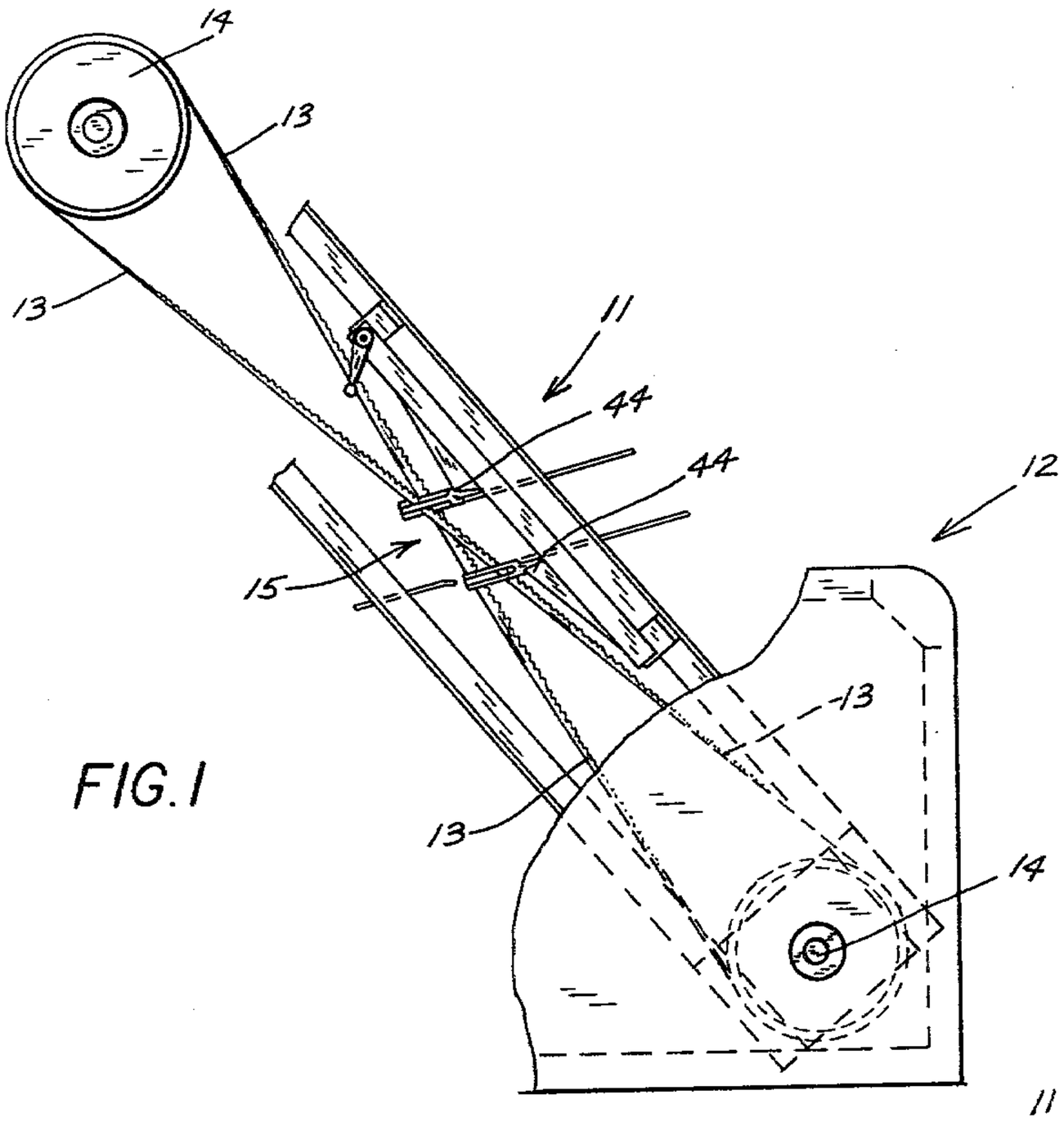


FIG. 1

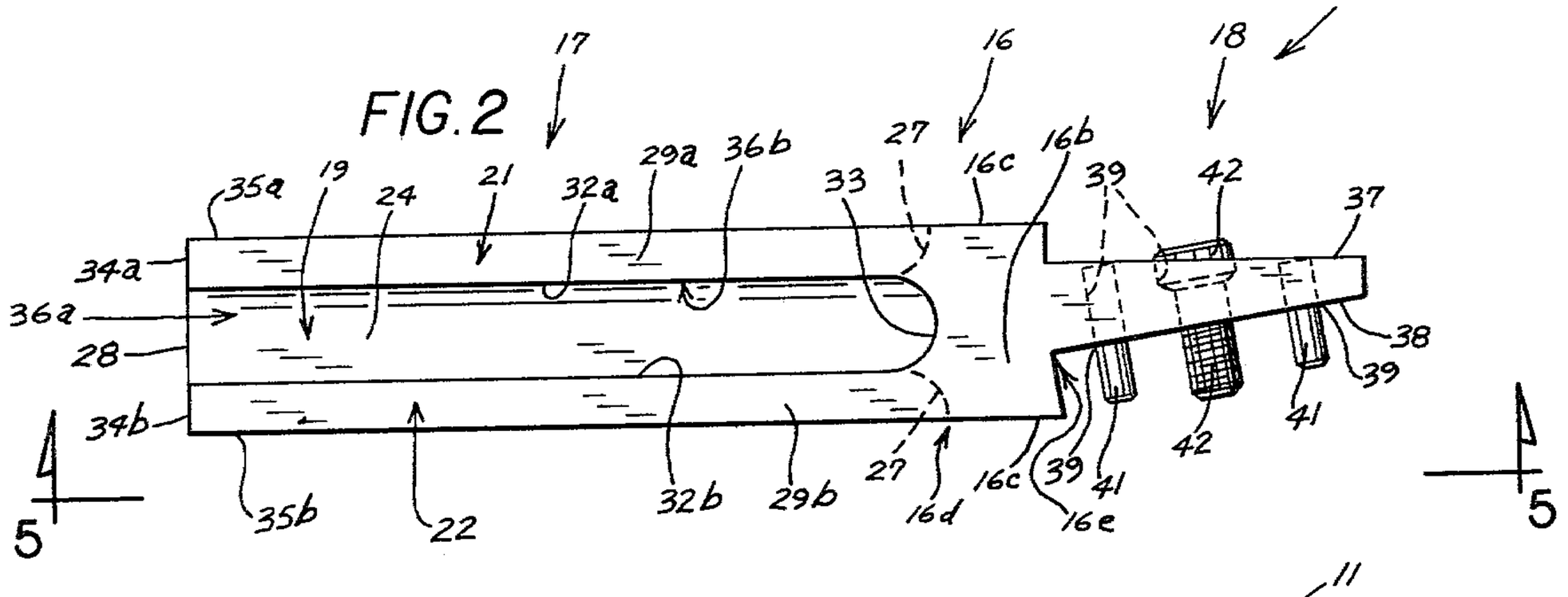


FIG. 2

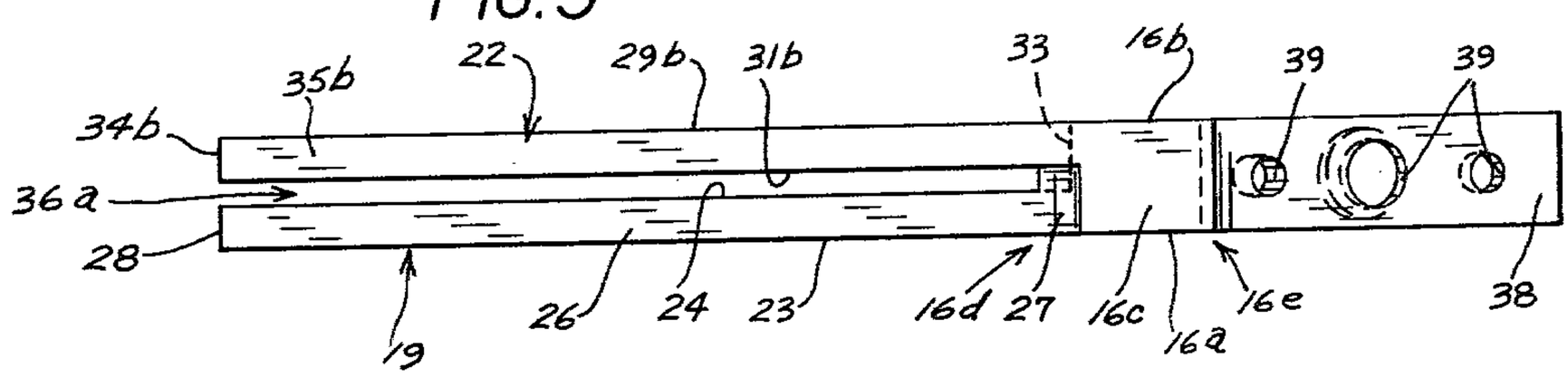


FIG. 5

FIG. 4

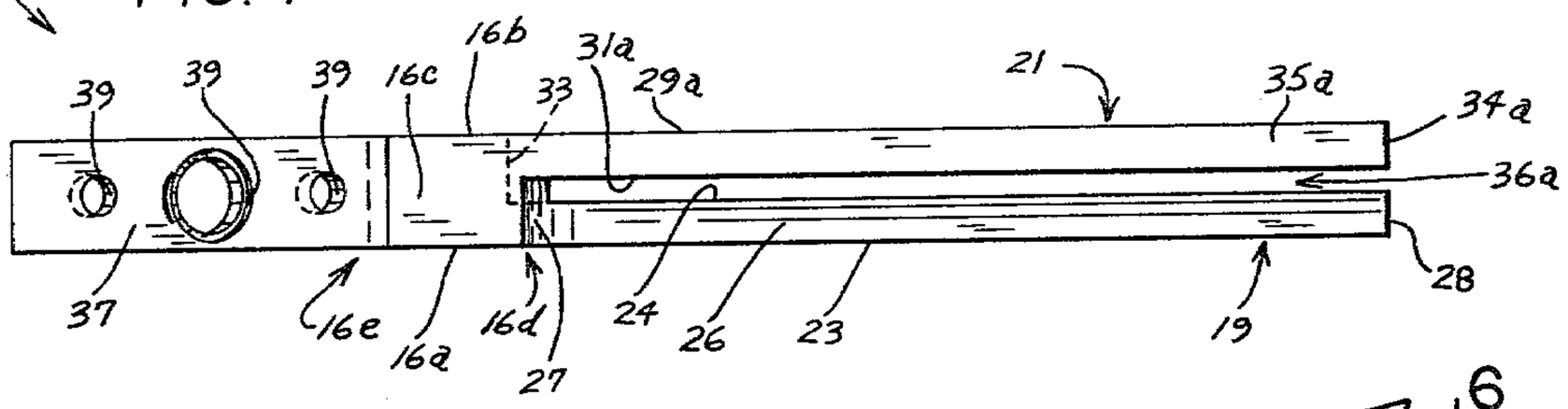


FIG. 3

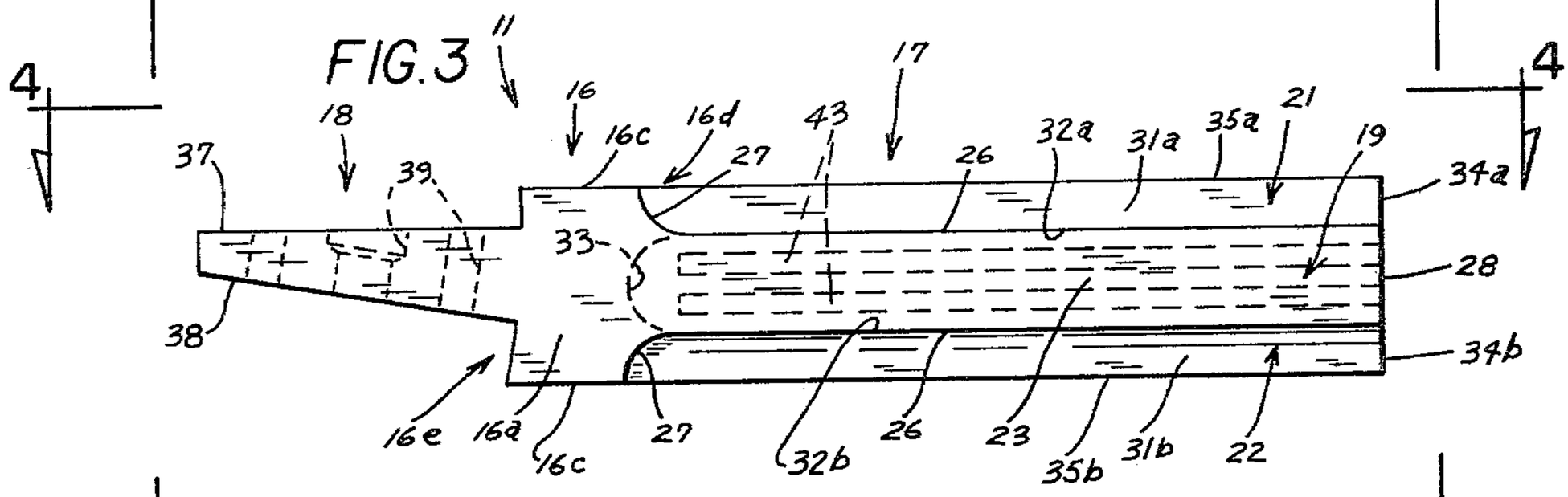


FIG. 6

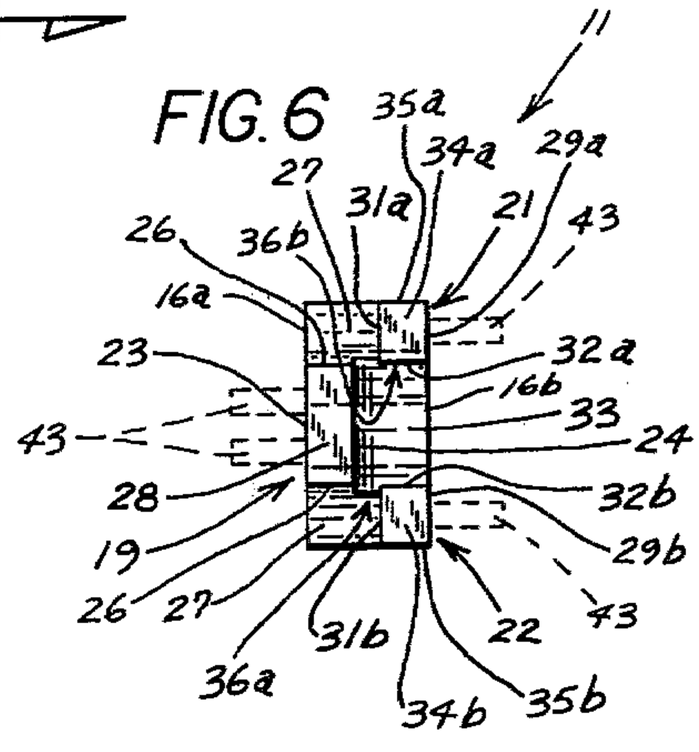
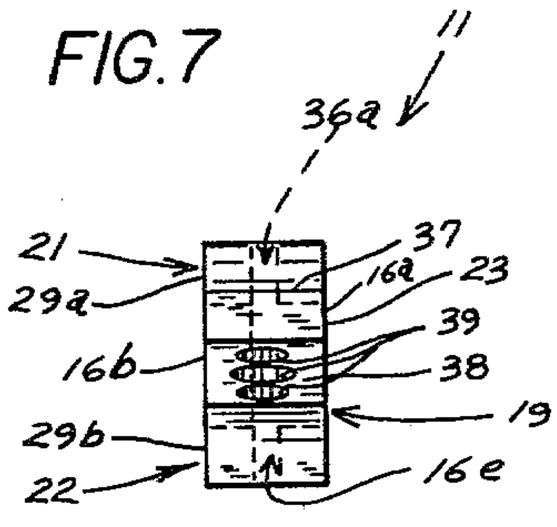


FIG. 7



BLADE GUIDE

TECHNICAL FIELD

This invention relates generally to bread slicing machines employing band blades. More particularly, this invention relates to guide structures for positioning the band blades for proper slicing of bread loaves.

BACKGROUND ART

Slicing machines in the bakery industry generally comprise a pair of cylindrical drums which are spaced apart and drive a plurality of band blades extending therebetween. Typically the band blades are crossed between the drums, the blades appearing to have a figure "8" configuration when viewed from the side. The bread loaves are guided through the machine intermediate the drums and pass through the band blades in the zone where the blades are crossed. Each band blade passes through the bread twice, simultaneously, and in opposite directions.

The slicing machines typically have a multitude of guide fingers mounted between the drums and on each side of the blade crossover area. The purpose of the guide fingers is to twist each band blade such that the oppositely moving portions of the blade are parallel to each other and, in the usual case, are normal to the bread loaves while passing therethrough, whereby bread slices are produced of controlled thickness and with parallel surfaces. Twisting of the band blades is effected by certain surfaces of the guide fingers exerting pressure upon the band blades as the blades pass through the guide fingers.

Movement of the band blades against the guide finger surfaces causes both the blades and the blade guides to wear. Furthermore, friction causes heat to build up in the blade guides. Eventually, the blades become too dull to properly cut the bread loaves; and the blade guides tend to damage the blades and to break, or to seize the blades or to otherwise jam the bread slicing machine such as by collecting bread crumbs or the like.

To reduce the amount of wear, present blade guides have been provided with hard chrome wear surfaces. Some blade guides have been provided with carbide inserts for wear surfaces. Nevertheless, present blade guides typically have a useful life of approximately two years only. Furthermore, present blade guides are of multi-piece construction, silver-soldered together, which results in significant fabrication costs.

DISCLOSURE OF INVENTION

Responding to the needs described above, this invention provides a blade guide having a body portion. Guide and attachment portions are contiguous with the body portion, extending away from opposite ends of the body portion. The guide includes a plurality of prongs which define a channel within which the blade is received. The prongs bear treated wear surfaces.

It is an object of this invention to provide a blade guide of improved strength.

Another object of this invention is to provide a blade guide which more readily retains its proper alignment in a bread slicing machine.

Also an object of this invention is the provision of a blade guide having improved wear surfaces.

A further object of this invention is the provision of a blade guide which has superior heat dissipation characteristics and which resists accumulation thereon of bread crumbs and other materials.

Yet another object of this invention is provision of a blade guide having an increased useful life and a decreased tendency to clamp against the band blades or otherwise jam the the bread slicing machine.

Still another object of this invention is to provide a blade guide of such construction that flame spraying and boronzing techniques may be employed to achieve increased resistance to wear and longer useful life of portions thereof.

It is an object of this invention to provide a blade guide which is relatively inexpensive to fabricate yet is of sturdy construction and capable of achieving the aforementioned objects.

These objects and other features and advantages of this blade guide invention will become readily apparent upon referring to the following description in conjunction with the appended drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

The blade guide invention is illustrated in the drawings wherein:

FIG. **1** is a fragmentary, side elevational view, showing portions of a bread slicing machine employing the blade guides of this invention;

FIG. **2** is an enlarged, elevational view of one side of the blade guide;

FIG. **3** is an enlarged, elevational view of the opposite side of the blade guide;

FIG. **4** is an enlarged, top plan view of the blade guide;

FIG. **5** is an enlarged, bottom plan view of the blade guide:

FIG. **6** is an enlarged, elevational view showing the free end of the blade guide; and

FIG. **7** is an enlarged, elevational view showing the fixed end of the blade guide.

BEST MODE FOR CARRYING OUT THE INVENTION

The blade guide invention is shown generally at **11** in FIG. **1** positioned in a machine **12** for slicing bread. The machine **12** includes a plurality of band blades **13** disposed in side-by-side relationship. The blades **13** extend between, and are driven by, two rotating drums **14**. Each blade **13** is mounted such that in side elevation it appears to "cross over", as at **15**, thereby assuming a figure-8 configuration. The blade guide **11** is unitary in construction and more particularly includes body, guide and attachment portions **16, 17, 18**.

The body **16** includes parallel side surfaces **16***a*, **16***b*. Upper and lower surfaces **16***c* extend between the side surfaces **16***a*, **16***b*. The body **16** also has front and rear end areas **16***d*, **16***e*.

The guide portion **17** includes first, second and third guide prongs **19, 21, 22** contiguous with, and extending from the front end **16***d* of, the body portion **16**. The first guide prong **19** has an outside surface **23** flush with the surface **16***a* of the body portion **16**. The prong **19** also has an inside wear surface **24**. Longitudinal surfaces **26** of the prong **19** begin with arcuate portions **27** adjacent the body **16** and terminate at the extended free end **28**. The prong **19** generally is rectangular in cross section, the dimension of the prong **19** between surfaces **26** being less than that between surfaces **16***c*.

The second and third guide prongs **21, 22** having outside surfaces **29***a*, **29***b* respectively which are flush

with the surface **16***b* of body **16**. The guide prongs **21**, **22** have inside wear surfaces **31***a*, **31***b*. Inwardly facing longitudinal surfaces **32***a*, **32***b* begin at an arcuate contiguous surface **33** of the body front end **16***d* and terminate at free ends **34***a*, **34***b*. Outwardly facing longitudinal surfaces **35***a*, **35***b* begin adjacent body **16**, flush with surfaces **16***c*, and terminate at the free ends **34***a*, **34***b*. The prongs **21**, **22** generally are rectangular in cross section, the dimensions thereof between surfaces **32***a*, **35***a*, and between surfaces **32***b*, **35***b* being less than that between surfaces **16***c*.

The guide prongs **19**, **21**, **22** are disposed such that the outside surfaces **23**, **29***a*, **29***b* and wear surfaces **24**, **31***a*, **31***b* are parallel. The prongs **21**, **22** are disposed to one side, and the prong **19** to the opposite side, of a plane which bisects the body **16** and is parallel to surfaces **16***a*, **16***b*. A channel **36***a* is formed thereby between the prongs **19**, **21**, **22**; and the wear surface **24** generally faces the wear surfaces **31***a*, **31***b* across the channel **36***a*. The guide prongs **21**, **22** are disposed in side-by-side relationship such that a slot **36***b* is formed between longitudinal surfaces **32***a*, **32***b*. More particularly, the wear surface **24** is disposed directly opposite the slot **36***b*, the area of surface **24** being somewhat the same as that of slot **36***b*. The wear surfaces **31***a*, **31***b* more particularly are disposed opposite the spaces adjacent the longitudinal and arcuate surfaces **26**, **27** of the first prong **19**.

The attachment portion **18** extends from the body rear end **16***e* in the direction opposite that of the guide portion **17**. The portion **18** includes a first surface **37** generally parallel to surfaces **16***c*, **26**, **35***a*, **35***b*. Portion **18** also includes an opposite, mounting surface **38** disposed at an angle to the first surface **37**. A plurality of bores **39** are formed through the portion **18**, through the surfaces **37**, **38**. The longitudinal axes of the bores **39** are parallel to each other and normal to the surface **38**. Guide pins **14** are received in the bores **39** adjacent the ends of portion **18**, the pins **41** projecting away from surface **38**. An attachment bolt **42** extends through the central bore **39**, beyond surface **38**, into the standard mounting structures of the slicing machine **12**. The guide pins **41** may be cast, instead of pressed, into the bores **39**.

The blade guide **11** is fabricated in one piece, preferably from high-carbon, chrome-vanadium steel. The wear surfaces **24**, **31***a*, **31***b* are treated to form a metal carbide or a metal boride surface by flame spraying or boronzing techniques, respectively, known to those skilled in the art.

The blade guide **11** may be modified by the addition of a plurality of fins **43** to the prongs **19**, **21**, **22**. The fins **43** are attached normal to the outside surfaces **23**, **29***a*, **29***b* and extend parallel to the longitudinal axes of the guide prongs **19**, **21**, **22**. Also, a blade guide **11** may be fabricated which would be the mirror image of the guide **11** as illustrated in the drawings.

The blade guides **11** are mounted in standard fashion, the surfaces **38** being disposed against the machine **12** mounting structures. The usual spacing adjustments are made to the guides **11** to effect the desired bread slice thickness. The band blades **13** are disposed through the channels **36***a*.

When the slicing machine **12** is in operation, the wear surfaces **24**, **31***a*, **31***b* of the guides **11** press against the blades **13**, thereby causing the blades **13** to be parallel in the cross-over area **15** through which the bread loaves are passing. The unitary construction of the guides **11** gives increased strength and steadier attachment and alignment at **44** in the machine **12**, thereby facilitating an accurate and consistent bread slice thickness.

The metal carbide or metal boride wear surfaces **24**, **31***a*, **31***b* have superior abrasion resistant properties, and this results in a greater useful life for the guides **11**. Furthermore, the metal carbide or metal boride wear surfaces **24**, **31***a*, **31***b* have a lower coefficient of friction run against the steel and therefore less heat is generated by friction during operation of the machine, thereby increasing the useful life of the band blades **13** and reducing the tendency of the guides **11** to seize the blades **13**. The unitary construction of the blade guide **11** and the arrangement and conformation of the guide prongs **19**, **21**, **22** enable flame-spraying and boronzing techniques to be employed to create the superior wear surfaces **24**, **31***a*, **31***b*.

The open arrangement of the prongs **19**, **21**, **22** also increase heat dissipation from the wear surfaces **24**, **31***a*, **31***b*, reducing thermal expansion, extending blade guide **11** life and reducing the likelihood of jamming. The arrangement and configuration of the guide prongs **19**, **21**, **22** encourages bread crumbs and the like to fall out of the guides **11**, thereby also reducing the likelihood of the guides **11** seizing the band blades **13**.

The industrial applicability of this blade guide invention is believed to be apparent from the foregoing description. Although a preferred embodiment and modifications thereof have been disclosed herein, it is to be remembered that various alternate constructions can be made thereto without departing from the scope of this invention.

I claim:

1. A blade guide for use in bread slicing machines employing band blades, said guide comprising:

body means for attachment to a slicing machine; and

means for guiding band blades, including first and second guide structures extending from said body means and forming a guide channel therebetween, said first guide structure including at least one first guide prong, said second guide structure including at least two second guide prongs, said first and second guide prongs having wear surfaces which face each other across said guide channel, said second guide prongs being spaced apart to form a slot communicating with said guide channel, said first guide prong being disposed such that said slot is across said guide channel from said first guide prong's wear surface, the band blade being received in said guide channel.

2. A blade guide for use in bread slicing machines employing band blades, said guide comprising:

body means for attachment to a slicing machine; and

means for guiding band blades, including first and second guide structures extending from said body means and forming a guide channel therebetween, said first guide structure including at least one first guide prong, said second guide structure including at least two second guide prongs, said first and second guide prongs having wear surfaces which face each other across said guide channel, said first guide prong has longitudinal surface defining spaces disposed to each side of said first guide prong, said spaces communicating with said guide channel, said second guide prongs being disposed such that said spaces are across said guide channel from said second guide prong's wear surfaces, the band blade being received in said guide channel.

3. The blade guide of claim 1 or 2 and further wherein said wear surfaces are formed of a metal carbide.

4. The blade guide of claim 1 or 2 and further wherein said wear surfaces are formed of a metal boride.

5. The blade guide of claim 1 or 2 and further wherein said first and second guide prongs have surfaces directed away from said guide channel, said surfaces having a plurality of fins joined thereto.

6. The blade guide of claim 1 or 2 and further wherein said body means and means for guiding band blades form a unitary construction.

7. A blade guide for use in bread slicing machines employing band blades, said guide comprising:

unitary means having body means for attachment to a slicing machine and means for guiding band blades contiguous with said body means;

said means for guiding having a plurality of prongs and a guide channel disposed between said prongs, no prong being directly facing another prong across said guide channel, wear surfaces of hardened material being formed on said prongs.

8. The blade guide of claim 7 wherein the hardened material is metal carbide.

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